

PA -

Needed for Oct shipment
of 13 Run air

Work Order ID 149865

149865

Page 1

August 05, 2016 2:26:30 PM

Item ID: D4961-043 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Tube Assembly
 Start Date: 10/6/2016 Start Qty: 12.00 *12* Cust Item ID:
 Required Date: 10/11/2016 Req'd Qty: 12.00 *12* Customer:

Reference:

Approvals: Process Plan: SL Date: AUG 05 2016 Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D4961	C								

110

0.00

110

Small Fab

Memo

0.80

Small Fab

1- Cut D4961-3 tube to size as per dwg

2- On one side of tube flare end as per dwg then slide sleeves and nuts, flare other side of tube as per dwg.

12 FF AUG 24 2016

120

QC5- Inspect part completeness to step on W/O

0.00

120

QC

Memo

0.04

Quality Control

(12) DAS 38 9-89 AUG 24 2016

130

Identify as per dwg & Stock Location: SL140

0.00

130

Packaging

Memo

0.02

Packaging

12 DAS 6 9-89 AUG 26 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
QUALITY ASSURANCE				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

Work Order ID 149865

August 05, 2016 2:26:30 PM

149865

Page 2

Item ID: D4961-043

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Tube Assembly

Start Date: 10/6/2016 Start Qty: 12.00

12

Cust Item ID:

Required Date: 10/11/2016 Req'd Qty: 12.00

12

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

QC21- Final Inspection - Work Order Release

0.00

140

QC

Memo

0.20

Quality Control



AUG 29 2016

DAS
21
9-89

AUG 26 2016

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition			
77-1104 6129 340 15 104				Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

Picklist Print

August 05, 2016 2:26:26 PM

Page 1

Work Order ID: 149865
 Parent Item: D4961-043
 Parent Item Name: Tube Assembly

149865
D4961-043

Start Date: 10/6/2016
 Start Qty: 12.00
 Required Date: 10/11/2016
 Required Qty: 12.00

Comments: IPP REV:A 15.02.18 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
AN818-L12J		Purchased	No				Each	35.0000		24			
AN818-L12J									**			AUG 11 2016	

Nut

Location	Loc Qty	Loc Code
CCK006 135470	20	FF AUG 24 2016 11
<u>m134955</u>	20	13
ST325	15	
<u>m134762</u>	15	

M304TR0.750W.049 Purchased No

M304TR0 750W 049

304 RD Tube .750 x .049W

Location	Loc Qty	Loc Code
GA002	334.684207	
M134306	2.75	
M134528	36.473684	
M134604	43.420524	
M134824	7.618947	
M135093	33.68421	
M135242	60	
<u>M135325</u>	50.736842	
M135373	100	

FF AUG 11 2016

3.157895

MS20819-12J Purchased No

MS20819-12J

Sleeve

Location	Loc Qty	Loc Code
ST305 135470	34	
<u>m134762</u>	14	
<u>m134955</u>	20	

FF AUG 11 2016

812
2
10
AUG 24 2016 FF

DQA: _____ Date: _____

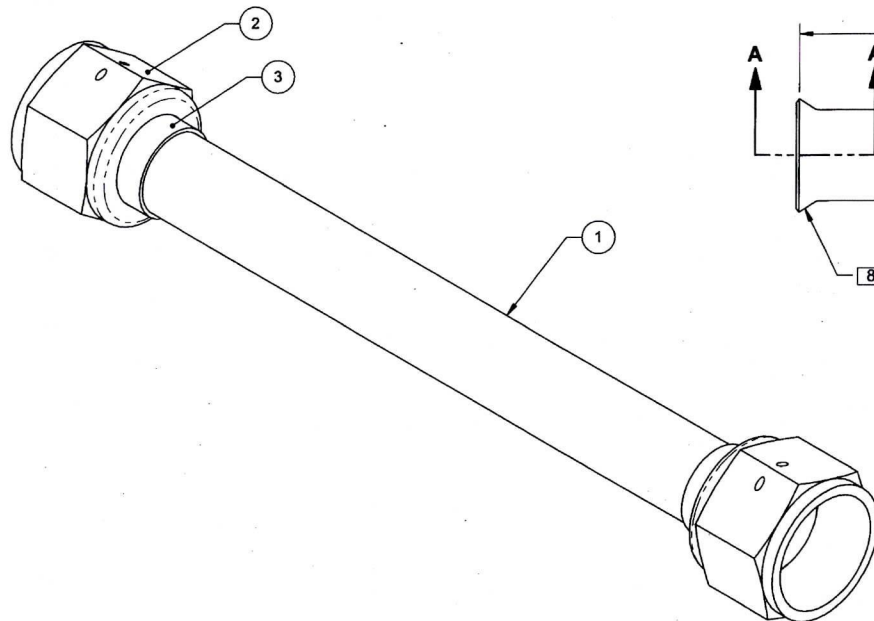
**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

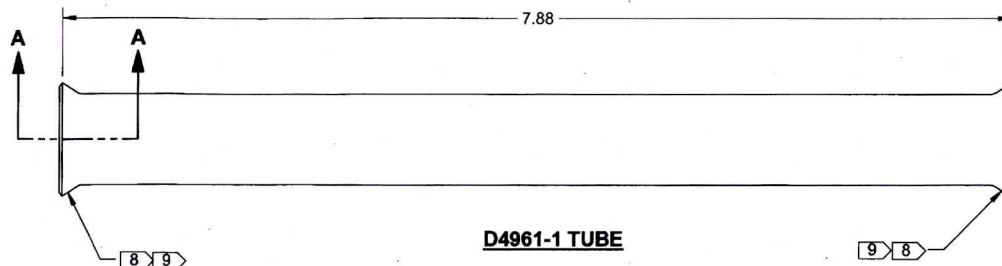
Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition			
8005 1 1 00A 8005 1 1 00A 8005 1 1 00A				Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Past Expiry Date ☐	Manufacturing Process ☐				
Misidentified ☐	Past Due ☐	OTHER :			

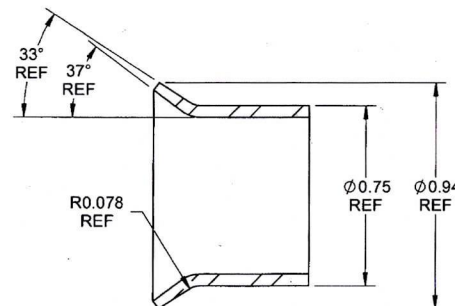
ITEM	QTY	P/N	DESCRIPTION
	X	D4961-041	TUBE ASSEMBLY
1	1	D4961-1	TUBE
2	2	AN818-L12J	NUT, TUBE COUPLING (DRILLED)
3	2	MS20819-12J	SLEEVE



D4961-041 TUBE ASSEMBLY



D4961-1 TUBE



SECTION A-A

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 149865
ST

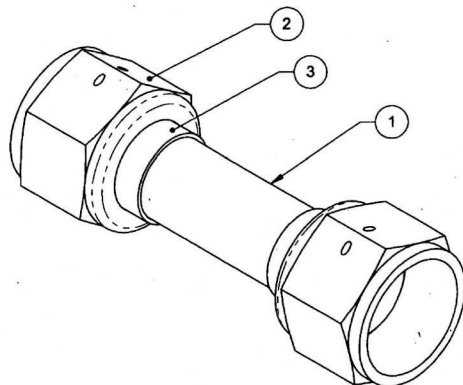
- NOTES:**
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL SEAMLESS ROUND TUBING, $\phi 0.750 \times 0.049$ WALL PER ASTM A213 OR ASME SA213 OR ASTM A269 (REF DART SPEC M304TR)
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
 - 7) WEIGHT: 0.59 lbs
 - 8) FLARE TUBE PER MS33584
 - 9) CLEAN INSIDE OF TUBE AFTER FLARING ENDS

RELEASED
2016-08-04
EN 16-622

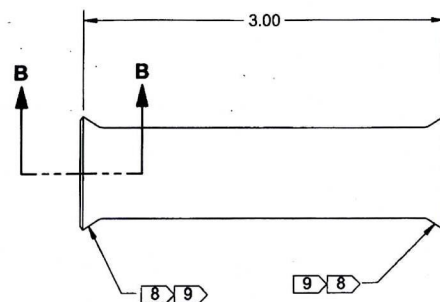
APPROVED

C	ADDED D4961-045 (SHEET 3)	CC	16.06.21
B	UPDATED BOM P/N AN818-L12J WAS AN818-12J. ADDED SHEET 2 (D4961-043)	AK	14.11.07
A	NEW ISSUE	VS	13.10.21
REV.	DESCRIPTION	BY	DATE
DESIGN	VS	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D4961 TUBE ASSEMBLY COPYRIGHT © 2016 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DRAWN	CC		
CHECKED	VS		
MFG. APPR.	DD		
APPROVED	HS		
DE APPR.	DS	REV. C SHEET 1 OF 3 SCALE NTS	
DATE	16.06.21		

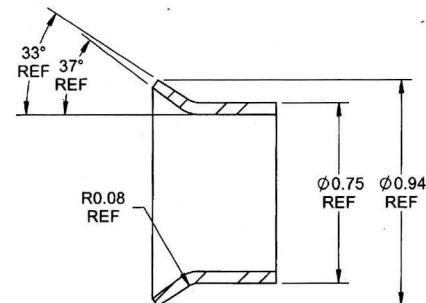
ITEM	QTY -043	P/N	DESCRIPTION
	X	D4961-043	TUBE ASSEMBLY
1	1	D4961-3	TUBE
2	2	AN818-L12J	NUT, TUBE COUPLING (DRILLED)
3	2	MS20819-12J	SLEEVE



D4961-043 TUBE ASSEMBLY



D4961-3 TUBE



SECTION B-B

- NOTES:**
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL SEAMLESS ROUND TUBING, $\phi 0.750 \times 0.049$ WALL PER ASTM A213 OR ASME SA213 OR ASTM A269 (REF DART SPEC M304TR)
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
 - 7) WEIGHT: 0.44 lbs
 - 8) FLARE TUBE PER MS33584
 - 9) CLEAN INSIDE OF TUBE AFTER FLARING ENDS

RELEASED
2016-08-04

APPROVED

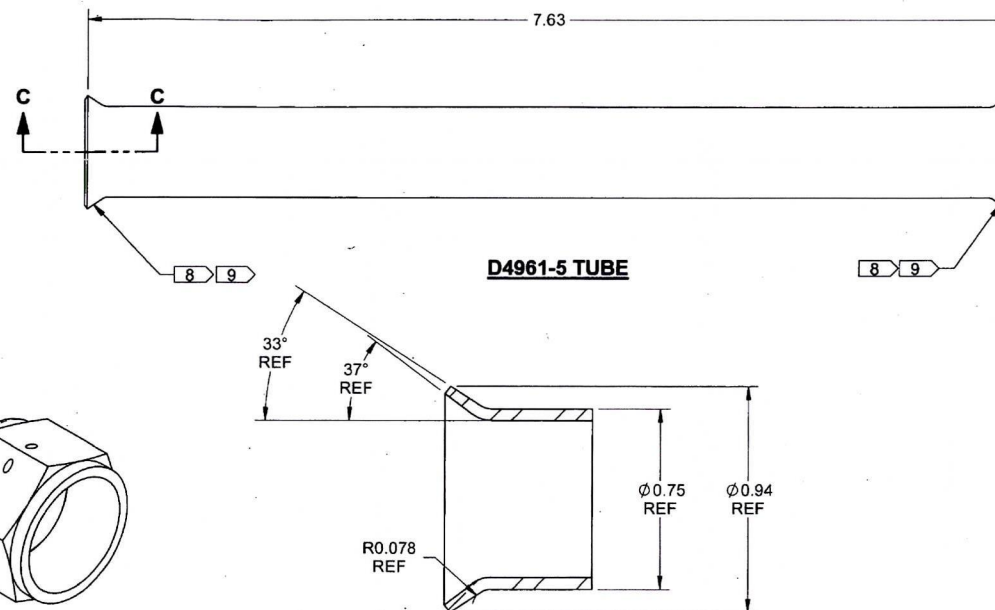
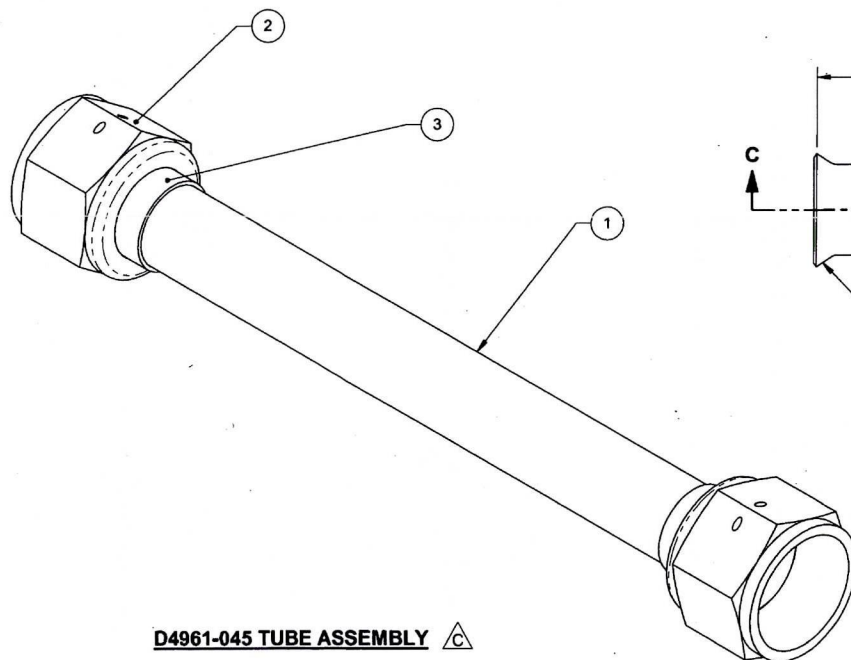
DESIGN	VS
DRAWN	CC
CHECKED	VS
MFG. APPR.	DD
APPROVED	HS
DE APPR.	DS
DATE	16.06.21

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. **D4961** REV. C
SHEET 2 OF 3
TITLE **TUBE ASSEMBLY** SCALE NTS

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ITEM	QTY	P/N	DESCRIPTION
	X	D4961-045	TUBE ASSEMBLY
1	1	D4961-5	TUBE
2	2	AN818-L12J	NUT
3	2	MS20819-12J	SLEEVE



- NOTES:
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL SEAMLESS ROUND TUBING, $\phi 0.750 \times 0.049$ WALL PER ASTM A213 OR ASME SA213 OR ASTM A269 (REF DART SPEC M304TR)
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
 - 7) WEIGHT: 0.59 lbs
 - 8) FLARE TUBE PER MS33584
 - 9) CLEAN INSIDE OF TUBE AFTER FLARING ENDS

RELEASED
2016-08-04

APPROVED

DESIGN	VS	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	CC		
CHECKED	VS	DRAWING NO.	REV. C
MFG. APPR.	DD	D4961	SHEET 3 OF 3
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	TUBE ASSEMBLY	NTS
DATE	16.06.21	COPYRIGHT © 2016 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DART AEROSPACE LTD		Work Order:	179865
Description: Tube Ass		Part Number:	D4961-043
Inspection Dwg: D4961 Rev: C		Page 1 of 1	

INSPECTION SHEET

[illegible]

Measured by:	FF	Checked by:	9-83	QC Inspector:	
Date:	AUG 24 2016	Date:	AUG 24 2016	Date:	

Engineering Approval: (If necessary)		Date:	
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Rev	Date	Change	Revised by	Approved
B	14.07.31	New Issue	KJ	